Airway Inspector

Chest Imaging Platform
Airway Inspector- Intro

• Goal: Assessment of airway wall thickness and airway lumen size.

• Airway wall thickening and lumen narrowing is a biomarker of obstructive lung diseases like Asthma and COPD.

• Automated airway wall segmentation from user-defined airway locations

References:
1. Select the CT input volume
2. Select an airway location of interest on the Slice window, place the mouse tip inside the airway lumen and click “a” to create a new Airway Point for analysis.

TIP
Enable Zoom view in the Data Probe section for a close-up view of the selected airway
Airway Selection Options

- After selecting the airway location, the airway viewer should display a centered airway. Several options enable the user to adjust the centering and reformatting:

  Threshold between airway lumen/airway wall.
  Tip: Change this threshold only if the airway is not properly centered.

  Enable/Disable Centering Options
  Tip: Enable refine center for precise centering in small airways

  Enable/Disable Reformatting along the airway Axis to obtain a orthogonal slice view of the airway
  Tip: Airway Inspector estimates the airway axis computing the Hessian. This option might not work properly if the CT volume does not have high resolution (voxel size < 1.5 mm).

  Airway wall segmentation view option
  Tip: The airway wall segmentation is performed in the “Analyzed Airway Wall” panel.
Performing Airway Measurements

- “Analyzed Airway Walls” performs automatic airway wall segmentation and the computation of airway metrics.

Airway Selector

*Tip:* After clicking “a” in the slice viewer, a new airway location is created. You can create multiple airway locations. Change the selected airway to display it in the airway viewer.

Airway Wall Segmentation Method

*Tip:* Zero crossing (of the second order derivative) is a good compromise between accuracy and speed.

Airway Wall Computation

*Tip:* Click on “Compute Wall for All Airways” if you want to analyze all the airway locations that have been selected. Airway results are displayed only for the selected airway.

Airway Measurements Summary

*Tip:* You can select a csv file to export the results for all airway locations.
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• The Airway Inspector module is part of the Chest Imaging Platform extension for 3D Slicer (www.chestimagingplatform.org)

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